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ABSTRACT

A study investigated the impact of cooperative education on the amount of starting salary attained by participating graduates when compared to nonparticipating graduates. A literature review focused on the history of cooperative education, program designs, and general student benefits. Career Planning and Placement Center survey results for the graduating classes of 1987-88 and 1988-89 from a large, Midwest university were used to determine the starting salary of its graduates (n=774). Cooperative education placement records were used to identify and isolate the experimental group of co-op graduates (n=152) from the control group of nonparticipating graduates (n=622). Applied instruments were a one-way test for homogeneity of variance, a mean salary computation by year, and a T-test. Results revealed a significant relationship between cooperative education participation and higher than average starting salaries. The experimental group acquired significantly higher starting salaries than the control group. (Contains 37 references.) (Author/YLB)

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A COMPARISON OF THE STARTING PAY OF COOPERATIVE EDUCATION GRADUATES WITH THAT OF NON-COOPERATIVE EDUCATION GRADUATES

A Capstone Seminar Paper
Presented to Drury College
in Partial Fulfillment of
the Requirements for the
Degree of Master of Education

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by

NEAL W. VICKERS

Dan Beach, Capstone Seminar Instructor

May, 1990

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A COMPARISON OF THE STARTING PAY OF COOPERATIVE EDUCATION GRADUATES WITH THAT OF NON-COOPERATIVE EDUCATION GRADUATES

Neal W. Vickers

Dan Beach, Capstone Seminar Instructor

ABSTRACT

Purpose: The present research investigated the impact Cooperative Education had on the amount of starting salary attained by participating graduates when compared to non-participating graduates.

Procedures: Career Planning and Placement survey results for the graduating classes 1987-88 and 1988-89, from a large, Midwest university were used to determine the starting salary of its graduates, (n=774). Cooperative Education placement records were utilized to identify and isolate the experimental group, (n=152), from the control group, (n=622). Applied instruments were a Oneway test for homogeneity of variance, a mean salary computation by year, and a T-test.

Findings: Results revealed a significant relationship between Cooperative Education participation and higher than average starting salaries. The experimental group acquired significantly higher starting salaries than the control group.

Conclusions: Using the given instruments, it was

concluded that participation in Cooperative Education can benefit graduates by providing them with higher starting salaries than their non-participating peers.

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CHAPTER ONE

Introduction

Much time and ink has been spent on research attempting to describe the best method of teaching. Although it is not the intention of this research to promote one mode of teaching as superior over another, it is clear that advantages and disadvantages exist for different methods. When looking for the best method, one should factor into their decision the situation, specific program purposes, and individual student needs. This research has looked at one mode of instruction which provides individual career development to its participants.

Experiential education, participation in an career related work experience or internship, has proven to be a very effective educational program for providing an avenue through which the student may develop and realize career goals (National Commission for Cooperative Education, 1975; Hammers, 1985). Because of this success our present system of education has incorporated it as a process of discovery. Don Super and other career development theorists recommend that students be encouraged and given many opportunities to explore the world of work (Powell, 1980). They feel this exploration reinforces learning and development.

Cooperative Education is the post-secondary,

higher education version of experiential education that involves students in the process of career exploration. Its basic goals are to enhance the educational benefits of students by providing actual on the job experiences. These experiences allow for the implementation of learned principles and generate increased opportunities for career recruitment. They also develop the student's confidence and provide opportunities for good career development. One potential benefit of participation in Cooperative Education is the possibility of larger starting salaries in the first job after graduation.

Purpose of the Study

In light of the preceding statements, this study was designed to address the postulate that greater starting salaries are acquired by students who participate in Cooperative Education than for their counterparts who do not. Thus, the primary focus of this study was on the differences in starting salaries, for the samples observed, in the first full-time job after graduation. Therefore the following research question was posed: Do students who participate in Cooperative Education actually obtain greater starting salaries than their counterparts in the first job after graduation?

Hypothesis

Students who participate in Cooperative Education programs obtain larger starting salaries than students who

do not.

Null Hypothesis

Students who participate in Cooperative Education do not actually obtain larger starting salaries than the those students who do not.

Significance of the Study

Research Goals

The purpose of this study was to determine whether Cooperative Education actually contributed significantly to the career earnings of its participants. Therefore, the null hypothesis could be rejected if a significant difference at the .05 level was discovered when applying a T-test to the mean salaries of the two observed groups.

Southwest Missouri State University, the institution contributing the data, wanted to learn some of the influences Cooperative Education had on the career development of its graduates. If the null hypothesis could be rejected, the results could then be submitted to the SMSU administration. These findings ultimately would be submitted to the U.S. and Missouri state departments of education, the university board of regents, and to accrediting organizations to lend support toward the institution fulfilling its academic mission.

Research Benefits

This research would be particularly beneficial to

Southwest Missouri State and their Cooperative Education office by verifying whether the proposed condition exists for their Co-op graduates, as it has indeed for many other university Co-op graduates. In addition, the application of this particular research hypothesis and model may be used by others to determine whether conditions, as indicated, exist in their environment, thus advocating further research.

Definition of Terms

Co-op

Co-op is an abbreviation for the Cooperative Education program. A more thorough definition of this program follows in the review of literature.

CPPC

CPPC is the Career Planning and Placement Center at Southwest Missouri State University, Springfield, Missouri.

CWS

The College Work Study Program (CWS) was established by the federal government in 1965 as an avenue for students to assist in the financing of their education (U.S. Dept. of Education, 1981, p. 5267). College Work Study is a federally subsidized employment program for needy students (U.S. Dept. of Education, 1981, p. 5266). Most students who participate in this program work on-campus, with many jobs not being career related.

JLD

Job Location and Development (JLD) is an off-campus employment program. The purpose of the program is to expand off-campus job opportunities for students enrolled in eligible institutions of higher education who want jobs, regardless of financial need. (U.S. Dept. of Education, 1981, p. 5279). Depending on the campus, this program may utilize federal funds, but the choice is at the discretion of the institution.

SMSU

Southwest Missouri State University (SMSU) is located in Springfield, Missouri. At the time of this study, SMSU had a record student population of over twenty-one thousand. The institution was founded in 1905 as the Fourth District Normal School and then in 1919 it became Southwest Missouri State Teachers College (Graduate Catalog, 1988, p. 10). One if SMSU's mission statements affirms "...the institution strives to develop a mutually beneficial relationship between the institution and the local public by using the community as a laboratory for teaching and learning, and by structuring research and service to meet the community's needs" (Graduate Catalog, 1988, p. 10). Therefore, SMSU has developed its Cooperative Education program in an attempt to meet this goal.

Limitations of the Study

Factors that could not be controlled for in this study were the student's age, socio-economic background, family and individual work ethic, the number of semesters a student had participated in Cooperative Education, and whether the salary reported to the university was for a full or part-time job.

CHAPTER TWO

Review Of Literature

Experiential Education

It is clearly observable that most teachers in post-secondary education use the lecture-based format of instruction. Many secondary educators also use lecture as a primary mode of instruction. Lecturing involves the instructor addressing students who are using their auditory facilities to listen and process data into their memory. This type of teaching is verbal, and labeled by Ausubel and Robinson (1969) as expository. It is believed by others that it is possible to present a subject to a student so they can first experience it, then react to a concrete presentation of it, and finally symbolize it (Bruner, 1966). This method of learning is labeled by Bruner (1966) as discovery learning. Although experiential education is not actually what Bruner had in mind, it does follow in the sequence that Bruner promotes. This active sequence of learning appeals to many as one of the best methods (Bruner, 1966; Hammers, 1985). Active participation of students in the learning process is becoming more common in educational settings because of the evidence that proves it to be superior to other modes of instruction, particularly lecture (Hammers, 1985). Experiential education provides opportunity for students to participate in the learning process.

Cooperative Education

Cooperative Education, the experiential education program focused on in this study, is defined by the U.S. Department of Education as

> a program which provides Federal financial assistance to help institutions of higher education offer students paid work experiences closely related to their academic and career pursuits, and to provide for specialized training and research to improve the effectiveness of programs of Cooperative Education (U.S. Dept. of Education, 1982, p. 17253).

While no single definition of Cooperative Education adequately describes the range of currently operative programs, for the purposes of this study one proposed by the Cooperative Education Association provides a working framework for our understanding:

> ...the integration of classroom theory with practical work experience under which students have specific periods of attendance...and specific periods of employment (Collins & Cohen, 1977, p. 13).

Thus defined, Cooperative Education is an academically based internship program coordinated cooperatively with the educational institution, business, and participating student.

History of Cooperative Education

Cooperative Education has a long history in the

United States. Herman Schneider of the University of Cincinnati started the first Cooperative Education program in their Engineering Department (Brown, 1984; Humbert, 1983). When that first program was introduced in this country in 1906 there was probably no awareness of the importance to the future of education and industry that experiential learning would play (Hamlin, 1978). Soon others began to follow in the footsteps of Cincinnati. In 1909, Northeastern University in Boston began Co-op, in 1911 the University of Detroit followed suit (Stanton, 1988). Drexel University started Co-op in 1919, as did the Massachusetts Institute of Technology (Heinemann, 1983). In 1921 Antioch College incorporated Co-op into their liberal arts curriculum (Stanton, 1988).

Basics of Cooperative Education

Cooperative Education provides a carefully planned environment that alternates between study and work to furnish career related experience, academic credit, and monetary compensation to the participating student (Humbert, 1983). It's an approach that provides a period of classroom study and then changes to a period of supervised public or private employment (Humbert, 1983). Most Co-op internships are for a minimum of one semester, with some lasting a full year. The majority are in the business environment and are usually located away from the educational institution. Coordination of

the program is conducted by the institution between the business and the participating student. The element of academic credit being granted for the experience gained, along with remuneration for time worked, make Cooperative Education unique from other internships. Many alternative internships are not paid and are short in duration. Most institutions with Cooperative Education allow only juniors and seniors to participate because of the academic inexperience of lower classmen. Participating businesses looking for career personnel usually prefer seniors because of their availability for recruitment in a few short months. Many businesses involved in Cooperative Education have an underlying motive, that is to examine likely career recruits through an employment program that requires no immediate commitment on their part yet offers potentially enormous profits.

Program Designs

Alternating Design

The most common design of Cooperative Education is one that alternates semesters of work with semesters of on-campus enrollment. This alternating semester design allows a junior or senior student to work one semester away from school then return the next semester with valuable experience and usually enough money saved to pay his or her college tuition in full. Because alternating Cooperative Education requires absence from the

educational institution precautions are taken to prevent the recruitment of students which would not allow them to return and complete their education. Participating businesses would not desire to employ someone who does not possess a degree; therefore, it is very rare that such instances occur. More often the student is the one who would like to continue with the company and not return to complete his or her education. However, Cook found that businesses are particularly careful not to allow this to happen (Sherry Cook, personal communication, April 21, 1987). Years of participation in Cooperative Education by business and industry have taught them that such practices are not productive. According to Wooldridge, Vice President for Co-op at Northeastern University,

> If anything, Co-op increases retention because the students are able to relate their experiences to the classroom. They [Co-op students] usually return to the classroom with increased motivation (Stanton, 1988, p. 22).

The negative consequences of alternating Cooperative Education are that a student must extend his or her education period the number of semesters he or she is away from the institution. In general this appears to be a small price to pay for the exceptional benefits gained.

Parallel Design

Parallel Cooperative Education is designed to

allow a student to be employed at night and simultaneously attend school during the day. Such opportunities are limited in number and tend to be more pressing upon the student.

General Student Benefits

It is also understandable that students who participate in learning that is carried outside of the classroom would gain a better perception of the relationship between theory and application. Although this is apparently true, there are many questions that remain to be posed by skeptics as to whether measurable evidence has been provided to show that participation in Co-op really brings additional benefits to the student.

According to the National Commission for Cooperative Education (1975),

> Co-op is the ultimate in personal and career development. Based on their experience, Co-op graduates usually command a higher starting salary than their counterparts from traditional programs. And they move more rapidly up the career ladder, receiving merit raises and promotions more frequently than their non Co-op associates (p.4).

In a recent study done in Detroit it was found that 94% of the Co-op graduates in the study received at least one merit increase in salary as opposed to 67% of the regular college students (Krupar, 1987). Another study

conducted at Boston College found exactly the same results for their Co-op and non Co-op graduates (Nielsen, 1984).

Former President Ronald Reagan said this of Cooperative Education:

> Americans who have worked their way through college take pride in their achievement. You are helping many more reach this goal, and helping America remain strong and vital (Co-op Education, 1975, p. i).

The one national education report which has addressed Cooperative Education directly is the National Commission on Secondary Vocational Education's publication, *The Unfinished Agenda* (1984). The Commission concluded that:

> Cooperative vocational education, a form of field-based learning, has been one of the most successful aspects of vocational education... (p. 19).
>
> ...Cooperative vocational education programs have high job placement records, and both students and employers express more satisfaction with this approach to field-based learning than any other (p. 20).

The general consensus of research conducted indicates that participation in Cooperative Education is very beneficial for all parties involved. Some benefits that Co-op provide have been shown to be, but are not limited to,

1. a realistic learning experience in which students may discover their interests and abilities,
2. an opportunity to develop work habits and attitudes necessary for maturity and confidence,
3. the occasion to give meaning and purpose to theoretical knowledge gained in the classroom,
4. the opportunity of gaining financial rewards along with employment skills, and
5. the providing of training in a chosen occupational field (Humbert, 1983).

In a recent survey done by Michigan State University, employers were asked what they considered the single most persistent problem they face when recruiting college graduates for employment in their organization. There were several problems cited, two of which were a lack of clear direction in career goals and a lack of prior career related work experiences (Scheetz, 1989). It would seem Cooperative Education is the remedy for these deficiencies.

Clearer Career Goals

Increased maturity, clearer career goals, positive personal change, and improved social attitudes are the reward for many Cooperative Education students (Wilson, 1974).

In a study conducted by Dean Weinstein (1981) it was proven that there existed a significant difference in the certainty toward career goals between Co-op students and non Co-op students. Weinstein (1981) found that 77% of Co-op students, as compared to 68% of non Co-op students, were very clear and satisfied with their choice for a career. This implies that more non Co-op students are vacillating with regard to career choice than are the Co-op students.

Personal Development

Good interpersonal skills are one of the most desired attributes college recruiters seek in graduates today (Sony Crews, personal communication, November, 1985). In Cooperative Education students learn to work with others (Hunt, 1974). Notable companies such as General Electric, Ford, 3M and Union Carbide have extremely positive comments regarding students whom they have employed through Cooperative Education (Hunt, 1974). Higher employee retention, greater productivity and faster advancement are all characteristics noticed of their Cooperative Education career recruits (Hunt, 1974). Although some of these claims are based on positive personal experiences, and not all based on objective evaluation, they are valid in terms of the value of Cooperative Education.

Increased Academic Achievement

Studies published by McNutt (1974) and Spect (1985) compared the academic achievement of Cooperative Education students when compared to non Co-op students. Both studies provided substantial evidence that comprehension, retention and grade point averages were higher in the Cooperative Education groups.

McNutt's (1974) study compared the mean GPA's of Co-op students with that of non Co-op students and found significantly higher GPA's in the Co-op group.

Spect's (1985) study compared lecture based instruction to Cooperative Education to determine if improved retention occurred in the Co-op students due to the level of participation. Her study provided significant evidence that Co-op students retention did improve more than other students.

A series of studies conducted in the 1970's found that Co-op students scored higher on Graduate Record Examination achievement tests (Stanton, 1988). In fact, one study found that a small but statistically significant difference in grades occurred between Co-op and non Co-op students, with the Co-op students receiving higher grades (Stanton, 1988).

Career Boosts

Getting a career boost is another one of the major

benefits of Cooperative Education programs (Hamlin, 1978; Hanks & Schiller, 1984; Harris & Hodgson, 1974.)

In the Harris & Hodgson (1974) study there was an acceptance and approval level of over 90% by both student and employer participants in the observed Cooperative Education program. As indicated by the 1032 students surveyed, the most beneficial aspect of participating in Co-op was the experience gained that helped rapidly secure careers (Harris & Hodgson, 1974).

Hamlin's (1978) study focused on the rate at which Co-op graduates and non Co-op graduates secured career jobs. His research showed that 63% of Co-op graduates secured a full-time job in less than one month after graduation, while only 37% of non Co-op graduates did. He also discovered that 54.1% of Co-op graduates received pay increases in the $2,501 - $ 5,000 range while only 45.9% of non Co-op graduates earned the same amount, and the Co-op graduates received promotions faster (Hamlin, 1978). Another significant finding was that 61% of the Co-op graduates held jobs in their major as compared to 39% of non Co-op graduates (Hamlin, 1978).

Many industrial giants, such as American Telephone and Telegraph, International Business Machines, Ford, Kraft Foods, and General Motors have indicated that they do much of their career recruiting from Cooperative Education (Sherry Cook, personal communication,

April 21, 1987).

Career Related Experience

Miami University provides their graduate students in communications a cable management seminar with the purpose of improving the participating students' prospects in the job market (Hanks & Schiller, 1984). This seminar came about because of a survey that indicated employer desire for more experienced students as career candidates (Hanks & Schiller, 1984).

Cooperative Education allows students to put into practice the knowledge and skills they learn in school (Hamlin, 1978). It provides an opportunity for students to get a head start in gaining professional experience in the area of their career choice (Hamlin, 1978). Successful work experiences help develop confidence and self worth. In our culture the means for proving one's worth is through successful achievement in work (McNutt, 1974).

Co-op Earnings While in School

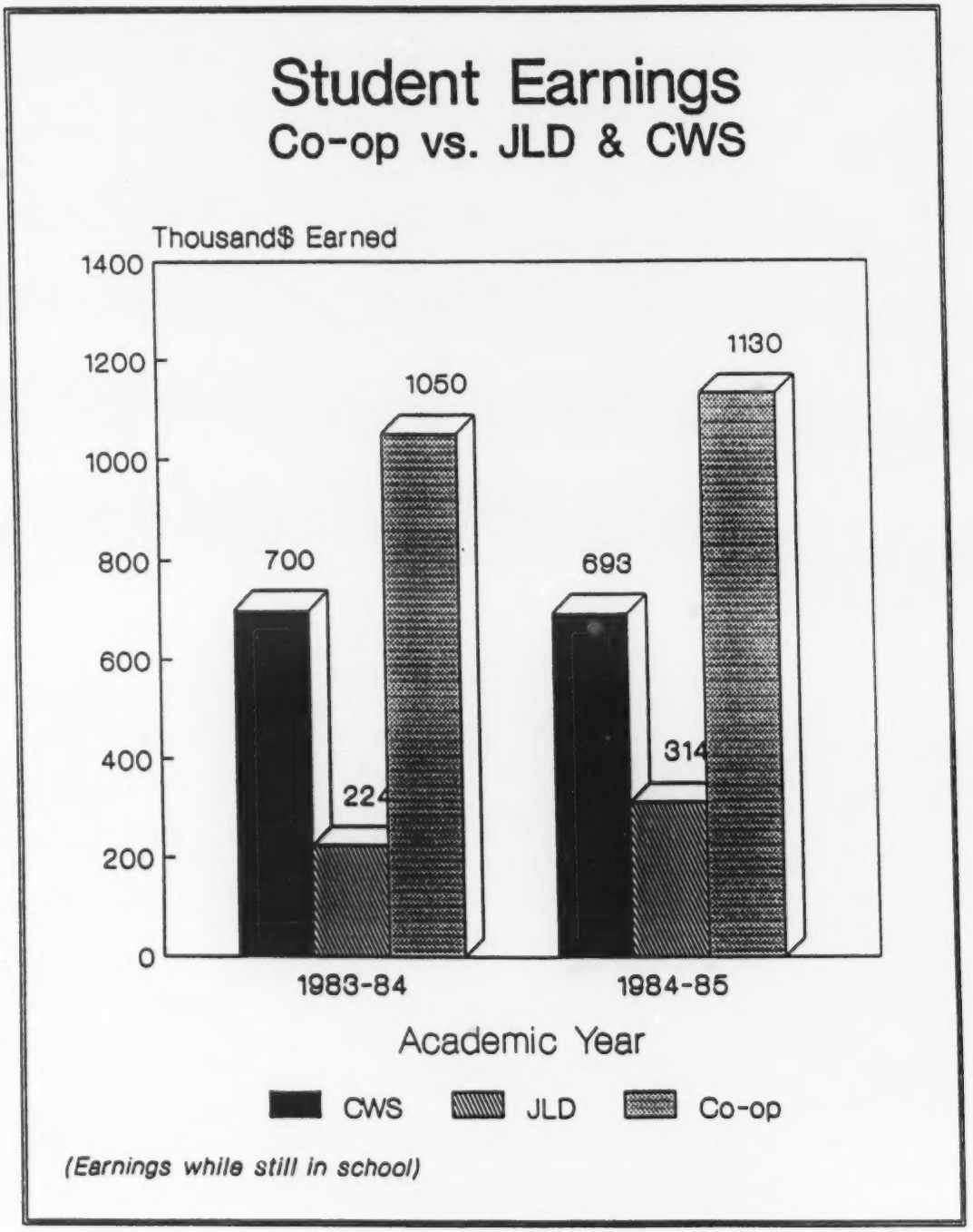
Studies done at Pace University (New York) in the 1981-82 academic year showed the 243 students who participated in Cooperative Education earned a total of $667,623, or an average or $2,692 per student (Korngold, 1983).

Nationally, Cooperative Education has provided approximately three to four times the earnings per student

when compared to any other employment program (The National Association of Student Employment Administrators, 1985). The National Association of Student Employment Administrators (1986) surveyed their member schools and discovered that students in Job Location and Development (off-campus, non-career related employment) earned a combined total of $224,186,908 while students in Cooperative Education earned a combined total of $1,050,000,000. It was found that 4.7 times the dollars were earned in 1983 by Co-op students over JLD students, and 2 times that of CWS programs. The 1984-85 Cooperative Education earnings reported were $1,134,000,000 (The National Association of Student Employment Administrators, 1986). JLD earnings for 1984-85 were $313,637,519 and CWS earnings were $693,000,000 (The National Association of Student Employment Administrators, 1986). Again Co-op students earned over 3.6 times the money JLD students did, and 1.6 times that which CWS students did.

In 1985-86 there were 12.2 million students enrolled in post-secondary institutions (The National Association of Student Employment Administrators, 1986). 788,000 were employed in CWS, 185,690 were employed in JLD, and only 180,000 were employed through Co-op (The National Association of Student Employment Administrators, 1986). 18% of the students obtained 52% of all the earnings. See Table #1 following for clarification.

Table 1


Student Earnings
Co-op vs. JLD & CWS
Thousand$ Earned
1400
1200
1000
800
600
400
200
0
700
224
1050
693
314
1130
1983-84
1984-85
Academic Year
CWS
JLD
Co-op
(Earnings while still in school)

Additional Benefits

In 1987 over 200,000 students participated in Cooperative Education in the United States (Stanton, 1988). One study conducted for the Office of Education, Department of Health, Education and Welfare, in Washington, D.C., concluded there are a number of benefits that accompany participation in Cooperative Education, not all monetary. A number of other significant circumstances were also discovered, those being:

1. For all programs considered, men generally earned more per week than women.
2. In post-secondary specific occupation programs, whites and blacks earned more per week than their comparison group members.
3. On the secondary level, men were more consistently employed than women.
4. On the post-secondary level, there were no measurable differences in job stability between men and women.
5. Blacks participating in post-secondary specific occupation programs worked more weeks per year than blacks in non-participating comparison groups (Walsh, 1976, p. 29).

The preceding facts appear to be very impressive, yet the ultimate benefit of participating in Cooperative Education

seems to be realized most after graduation and upon entry into the career. Not only do Cooperative Education students typically earn more than other working students, which makes financing a college education much more palatable, they also begin their careers with higher salaries than their peers.

Higher Career Earnings

A review of literature indicates that Cooperative Education does, in many cases and populations, produce higher starting salaries for its participants. Several studies have shown that Co-op graduates command higher starting salaries than their non-participating peers (National Commission for Cooperative Education, 1975; Hayes & Travis, 1976; Walsh & Breglio, 1976; Allwell, 1978; Hamlin, 1978; Weintraub, 1981 & 1982; Brailsford, 1982; Rogers & Weston, 1982; Stanton, 1988).

McNutt (1974) provided evidence that students who accumulated higher GPA's began careers at a significantly higher salary level than others. Her implication that Co-op experiences attribute to higher GPA's can also be interpreted to suggest that involvement in Co-op produces higher starting salaries.

Slick (1974) compared Cooperative Education students' career job earnings to those of students who participated in two other work programs. A sample of 2,165 students were surveyed approximately 18 months after graduation.

The findings of this study proved the majority of Co-op students earned over $200 weekly, while the majority of other graduates earned less than $100 per week. Other findings were that Co-op students kept their employment longer, were more satisfied with their jobs and pay, and that their employers were more satisfied with them than their peers who participated in other work programs (Slick, 1974).

Hamlin (1978) provided evidence that '74, '75, and '76 Co-op graduates of Northern Virginia Community College initially earned more than non Co-op graduates. His research showed that 33.9% of Co-op graduates earned over $10,000 annually while only 26.8% of their non-participating counterparts earned the same amount (Hamlin, 1978).

LaGuardia Community College, in Long Island City, New York, is a two year college that has a long history of Cooperative Education. A survey of LaGuardia's 1973 - 1977 graduates showed they averaged earning more than graduates from other area two year colleges (Weintraub, 1980). Weintraub followed with two consecutive studies in 1981 and 1982. In 1981, LaGuardia graduates starting salaries were averaging $11,584 annually, and 19.8% higher than other two year college graduates in the Middle Atlantic area (Weintraub, 1981). In 1982, LaGuardia graduates were earning starting salaries averaging 7.8%

higher than other two year graduates in the Middle Atlantic area (Wientraub, 1982). It should be noted that all LaGuardia students are required to participate in Cooperative Education. The apparent limitations of Weintraub's studies are that they do not compare to non Co-op samples from within his own institution. Even though this may diminish the overall validity of a comparison study, there are still strong implications in favor of Cooperative Education as a career development booster.

Hayes and Travis (1976) reported in their study that starting salaries for Cooperative Education graduates were 9% higher than for other college graduates.

Walsh and Breglio (1976) conducted research to assess the effectiveness of Cooperative Education in the nation's 100 largest urban secondary and post-secondary schools. This study was very large and encompassed just under 1,500 students from over 80 different institutions who responded. Their research concluded that after graduation, both secondary and post-secondary Cooperative Education graduates obtained higher paying jobs than their non-participating counterparts.

An evaluation of the Marymount College Cooperative Experiential Education Program by Allwell (1978) showed the mean salary of Co-op students versus non Co-op students to be extremely divergent. Co-op student mean

salaries were $9,595 with non Co-op student salaries at $8,434. The difference in mean salaries yielded a t score of 4.10, which was significant at the .01 level.

Rogers and Weston (1987) found that 73% of the Co-op Engineering graduates from North Carolina State University reported salaries of $24,000 and over, as compared to 43% of the non Co-op group.

Non-significant Studies

Brailsford (1982) conducted a study for the South Carolina State Department of Education to determine the effectiveness of Cooperative Education with regard to six hypotheses, one of which addressed earnings in the first full-time job after graduation. All of the studies reviewed by Brailsford, except for two, established that Co-op students were shown to earn higher weekly wages than non Co-op students (Brailsford, 1982, p. 8). A firsthand review of those two studies, Lewis (1976) and Kingston (1970), showed the researchers found no difference between the beginning earnings of Co-op and other graduates. However, Kingston (1970) did find a positive benefit of participating in Cooperative Education. She found that Co-op graduates received salary increases more rapidly than their counterparts (Kingston, 1970).

Walsh (1976) found that student participation in Cooperative Education at the secondary level appeared to have little effect on the average weekly earnings of those

interviewed. On the other hand, at the post-secondary level, respondents earned substantially more than their non-participating counterparts (Walsh, 1976).

Comparable Programs

Universities in Great Britain have developed a similar program to Cooperative Education known as Sandwich courses. In an investigation done by two professors at the University of Bradford, Hanson and Marshall (1978) discovered that former Sandwich course participants earned 15% more than the national norm at age 27, and 30% more at the age of 32.

Unpublished Studies

Le Moyne-Owen College, a small, all commuter, four year private, Christian college located in Memphis, Tennessee has found through Cooperative Education, tuition payments and career opportunities have been no problem for their students, (Odell Kinnon, personal communication, November 6, 1985).

The University Studied

The university studied in this research was a large, public, state university located in the Midwest with an enrollment of approximately 20,000 total full-time students. At the time of the research, Southwest Missouri State University's Co-op program had been operating for ten years. The Cooperative Education director indicated their program started with just a few students. Their

first year actually had only approximately seventy students participating (Cook, 1989). Ten years later in the 1989-90 academic year SMSU projected to have approximately 750 students participating in Co-op (Cook, 1989).

As the years progressed, SMSU increased their number of participating businesses and provided a larger number of opportunities for their students. In 1989 there were 353 employers participating in the program and the university projected that to rise to 450 in the 1991-92 academic year (Cook, 1989).

One amazing aspect with regard to SMSU's Co-op program was the high number of career job offers their students received from Co-op employers. In the last academic year, 1989, an estimated 70% of the alternating semester students received career job offers from their Co-op employers (Cook, 1989).

CHAPTER THREE

Method

Research Design

The research methodology for this study was an ex-post facto design. It was devised to measure whether a statistically significant difference, at greater than or equal to the .05 level, existed between the mean starting salaries of Cooperative Education students and non-Cooperative Education students. The actual samples were graduates from Southwest Missouri State University between the years of 1987-88 and 1988-89. The Null Hypothesis stated that students who participate in Cooperative Education do not actually obtain larger starting salaries than other non-participants.

The data was obtained from SMSU's Career Planning and Placement Center post-graduation surveys for graduates in the years observed. From the Placement Center's data the author was able to determine the student's name, major course of study, specific date of graduation and starting salary for the first job after graduation.

To isolate those students who had participated in Co-op, records were obtained from the Cooperative Education Office. These students were designated as the experimental group, and identified by a 2. The control group consisted of those remaining graduates who had not participated in Cooperative Education. The control group

cases were identified by a 1. After group assignment had been made a datafile was produced which contained only the salary, graduation date, and group identification number. This was done to insure each graduate's confidentiality.

The starting salaries of these two groups were then processed through *SPSS-PC Studentware* to determine their group means and then scored on a T-test for significance. In an attempt to control for differences in performance that may exist between graduates of different years, a mean salary calculation by graduation year was performed.

The mean salaries were then compared for the two groups by testing for homogeneity of variances within the groups. A frequency table was also produced to determine the range of salaries, along with the maximum and minimum. Finally, a T-test was then applied to determine the validity of the mean salary difference.

CHAPTER FOUR

Results

Population Size

There were 774 cases usable for the two years considered. Originally there had been 777 cases but two lacked complete information, and one wrapped onto another line because of its length, therefore the statistical package counted them as blank. The overall calculations were not affected by these blank entries, they were treated as invalid and missing.

The control group was the largest, consisting of 622 cases, while the experimental group consisted of 152 cases.

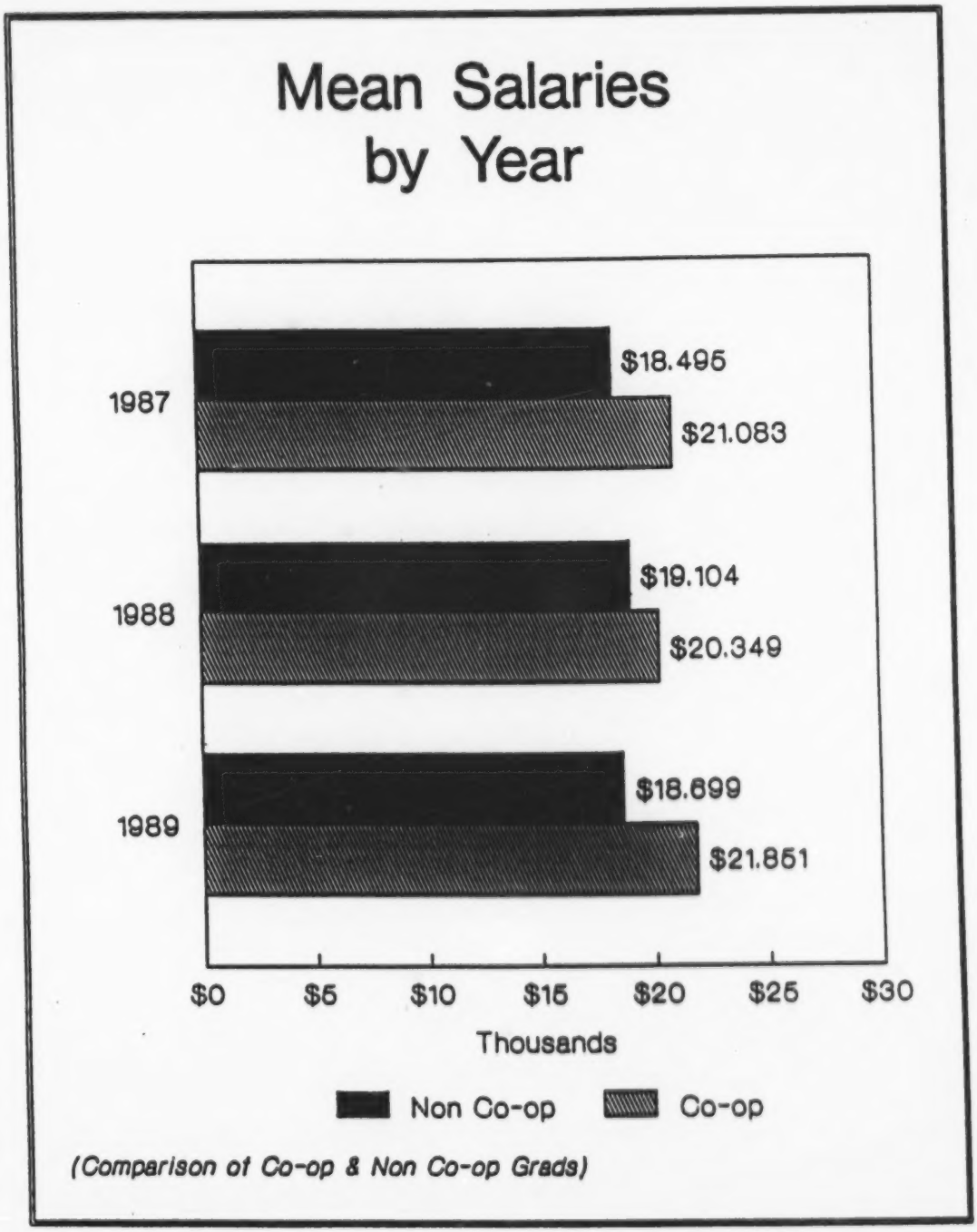
Mean Salaries and Standard Deviation

The mean salary for the control group was $18,873. The mean salary for the experimental group, or Co-op graduates, was $21,057. The standard deviation for the control group was $5,092. This means that 67% of the salaries reported were $18,873 +/- $5,092. Conversely, the standard deviation of the experimental group was $5,563; which means that 67% of the salaries reported were $21,057 +/- $5,563.

Mean Salaries by Year

The mean salaries by year, for the control and experimental groups, are displayed in Table 2 following. The data indicates a significantly larger starting salary for Co-op graduates over non Co-op graduates.

Table 2


Mean Salaries
by Year
1987
$18.495
$21.083
1988
$19.104
$20.349
1989
$18.699
$21.851
$0
$5
$10
$15
$20
$25
$30
Thousands
Non Co-op
Co-op
(Comparison of Co-op & Non Co-op Grads)

Salary Frequencies

Of the 774 cases observed, 19.6% were from the experimental group, or Co-op participants, with 80.4% of the cases belonging to the control group. The total salary range was $48,000, with the maximum reported being $50,000 and the minimum being $2,000.

Test for Homogeneity of Variance

In order for the T-test to be conclusive, a balanced range distribution of salaries must exist between the two groups, thus the necessity of this measurement.

The P score for this test was p=.082, which is >.05.

T-test

A 2-tail T-test for significance was employed in order to control for a difference in salaries in both directions. The F-Ratio value for our observations was 1.19 with a 2-tail probability of .153. The results of the pooled variance estimate produced a t value of 4.65 with a 2-tail probability of less than .001.

See Table 3 following for a graphic display of the Descriptive Statistics.

Table 3

Descriptive Statistics

Number of Samples:	
Experimental Group	n = 152
Control Group	n = 622
Total Cases Observed	n = 774
Means:	
Mean Experimental Group Salary	21,057
Standard Deviation	+/- 5,563
Mean Control Group Salary	18,873
Standard Deviation	+/- 5,091
Test for Homogeneity of Variance:	
Probability Score	p = .082
T - test for Significance:	
T - test Score	t = 4.65
Degrees of freedom	772
Probability	p < .001
F Value	f = 1.19
Probability	p = .153

CHAPTER FIVE

Discussion

Basically, the author's hypothesis stated that a difference existed between the two groups observed. The stated difference was to address whether there was a difference in starting salaries between Co-op and non Co-op graduates. It was also stated that the salary difference would be higher for the Co-op graduates.

Homogeneity of Variance

A test to determine if an equal salary range distribution existed for both groups was applied. In order for the results of the T-test to be credible, an equality of range must exist between the two groups observed.

Since the P score for this test was $p=.082$, which is $>.05$, we can conclude there is an equal distribution of salaries that exists for both groups. If this were not so, the results would be skewed and favor one group over another.

Significance of the T-test

The results of the T-test [$t(772) = 4.65$, $p<.001$] strongly imply that a significant difference exists between the salaries of the two observed groups. Therefore the null hypothesis can be rejected; and it can be concluded that the mean salaries of participants in Cooperative Education, who graduated from Southwest

Missouri State University between 1987-89, are considerably higher than their non-participating peers. Although, this is only proven to be true when considering the first job after graduation.

Conclusion

Using the given instruments, it can be concluded that participation in Cooperative Education can benefit graduates by rewarding them with higher starting salaries than their non-participating peers.

Considerations

Range of Salaries Reported

It was impossible for the author to know prior to the research, or from the data gathered, whether all jobs reported by the graduates were full-time. Therefore all salaries were treated as though they were for full-time jobs. Future research may take into consideration whether this differentiation can be made to insure a more homogeneous group comparison. It is questionable whether the lower end salaries reported by the graduates were actually full-time jobs.

Matched Pairing

It is also worthy of researching whether the implied differences in salary exist between particular sub-groups of graduates. This could be determined by dividing graduates by academic major and examining for differences within their own group.

Random Limited Selection

It would be feasible to randomly select 100 cases from both groups and then apply the same research methods to see if the implied difference would exist.

Final Considerations

It is undeniable that this research has significantly proven Cooperative Education to be an remarkable program of experiential education by its ability to provide greater starting salaries for its participants. Therefore it does merit considering the potential benefits of providing such an opportunity to any student who is desirous of these potential dividends.

In considering the contributions this research has provided the author poses a statement and question to contemplate. The author believes an institution of higher education, with a mission of preparing young men and women to excel in the disciplines of the arts and sciences, must ultimately measure its successfulness by the ease and consistency in which the institution's graduates emanate into the job market and succeed. Many in the academic community may not agree with the author's preceding statement, yet most accrediting agencies do in fact judge an institutions work and success as indicated in the aforementioned statement. With this and the foregoing research assertions in mind, doesn't a program of experiential education, such as Cooperative Education,

provide added possibilities to a graduate's chance for success in the job market?

Our society is rapidly transforming into a fierce, competitive world market. It's commonly alleged that America's educational system is inadequately producing new workers for this changing new marketplace. Cooperative Education holds promise for redirecting education in ways that better meet society's needs today and help address critical problems that have proven resistant to traditional forms of schooling (Heinemann, 1983). It therefore warrants that those of us who are in the academic community continually consider new and better ways in which to educate the students who enroll in our institutions. It's our future we are developing when we implement new educational programs, not just the manipulation of dollars and students.

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